

## **WHAT IS CLAIMED IS:**

1. A state of charge indicator for determining the current capacity of a battery, comprising:
  - a housing;
  - a microprocessor disposed in said housing and operable to determine current state of charge for a plurality of different battery types; and
  - a sensing device located in one of said housing and said battery, and electrically connected to said microprocessor, to measure voltage drop in said battery; wherein said housing is removably attachable to said battery.
2. The state of charge indicator according to claim 1, wherein the housing is constructed with a unique shape and keyed such that it will fit only into appropriate said plurality of different battery types.
3. The state of charge indicator according to claim 1, wherein the housing is constructed with a unique shape and keyed so as to fit into said battery in only one orientation for proper mating of interconnecting electrical contacts.
4. The state of charge indicator according to claim 1, further comprising a sealing feature for affixing said housing to the battery.
5. The state of charge indicator according to claim 1, further comprising a fastener for securing said housing to the battery.

6. The state of charge indicator according to claim 1, wherein said housing is plugged into said battery.

7. The state of charge indicator according to claim 1, wherein said sensing device is electrically connected to said microprocessor through at least one contact for measuring the voltage drop in said battery and wherein said at least one contact further provides power to said microprocessor.

8. The state of charge indicator according to claim 1, wherein said microprocessor is pre-programmable to determine state of charge of a particular type of battery chosen from said plurality of different battery types.

9. The state of charge indicator according to claim 1, wherein said microprocessor is programmable to determine state of charge of a particular type of battery chosen from said plurality of different battery types.

10. The state of charge indicator according to claim 1 further comprising a display disposed in said housing operable to show the current state of charge of said battery.

11. The state of charge indicator according to claim 8, wherein said display has a fuel gage showing the current charge of said battery.

12. The state of charge indicator according to claim 1, wherein said housing comprises means for outputting the current state of charge to an external device.

13. The state of charge indicator according to claim 12, wherein said external device comprises at least one of an audio means and a video means.
14. The state of charge indicator according to claim 1, wherein when said microprocessor is removed from said battery, said microprocessor is automatically reset.
15. The state of charge indicator according to claim 1, wherein when said microprocessor is removed from said battery and reinstalled into said battery, said microprocessor reads a state of charge stored in said battery.
16. The state of charge indicator according to claim 1, wherein said sensing device is in the housing.
17. The state of charge indicator according to claim 1, wherein said sensing device is in the battery.
18. The state of charge indicator according to claim 1, wherein said sensing device is a sense resistor.
19. The state of charge indicator according to claim 1, wherein said at least one contact electrically connects said microprocessor to said battery for providing additional information from said battery.
20. A system of determining state of charge of a battery comprising:  
a battery having a sensing device to measure battery capacity;

a reusable state of charge indicator having a microprocessor compatible with different battery types and operable to determine state of charge based on value received from said sensing device; and

at least one contact electrically connecting said state of charge indicator to said battery for providing voltage drop information from said sensing device,

wherein said state of charge indicator is removably attachable to said battery.

21. The system of determining state of charge of a battery according to claim 20, wherein said microprocessor is pre-programmable for a particular battery type chosen from said plurality of battery types.

22. The system of determining state of charge of a battery according to claim 20, wherein said microprocessor is programmable for a particular battery type chosen from said plurality of battery types.

23. The system of determining state of charge of a battery according to claim 20, wherein said state of charge indicator is externally attached to one surface of said battery.

24. The system of determining state of charge of a battery according to claim 23, further comprising a sealing feature to affix said state of charge indicator to said battery.

25. The system of determining state of charge of a battery according to claim 24, further comprising a fastener for securing said state of charge indicator to said battery.

26. The system of determining state of charge of a battery according to claim 20, wherein said battery has at least two legs and said state of charge indicator is attached to one leg of said at least two legs and each other leg of said at least two legs has a series resistor for balanced discharge.

27. The system according to claim 20, wherein said battery has a cavity and wherein said state of charge indicator plugs into said cavity of said battery.

28. The system according to claim 20, wherein said at least one contact provides power to said microprocessor.

29. The system according to claim 20, further comprising display means for displaying the current state of charge of said battery.

30. The system according to claim 29, wherein said display means is a fuel gage.

31. The system according to claim 29, wherein said display means is disposed in said state of charge indicator.

32. The system according to claim 29, wherein said display means is one of an audio device and a visual device, connected to said state of charge indicator via output means.

33. The system according to claim 20, wherein said battery is a lithium battery.

34. The system according to claim 20, wherein said battery is in military range covered by MIL-PRF-49471B.

35. The system according to claim 20, wherein said battery further comprises a memory chip, and said at least one contact electrically connects said microprocessor with said memory chip.

36. The system according to claim 20, wherein said battery further comprises a plurality of receptacles corresponding to said plurality of contacts in said state of charge indicator and a label covering said receptacles.

37. A system of determining state of charge of a battery comprising:  
a battery having a sensing device to measure battery capacity;  
a reusable state of charge indicator having a microprocessor to determine state of charge of said battery based on value received from said sensing device; and  
at least one contact electrically connecting said state of charge indicator to said battery for providing voltage drop information from said sensing device,  
wherein said state of charge indicator is removably attachable to said battery.

38. The system of determining state of charge of a battery according to claim 37, further comprising a sealing feature to affix said state of charge indicator to said battery.

39. The system of determining state of charge of a battery according to claim 38, further comprising a fastener for securing said state of charge indicator to said battery.

40. The system of determining state of charge of a battery according to claim 37, wherein said state of charge indicator is externally attached to one surface of said battery.

41. The system of determining state of charge of a battery according to claim 37, wherein said battery has at least two legs and said state of charge indicator is attached to one leg of said at least two legs and each other leg of said at least two legs has a series resistor for balanced discharge.

42. The system according to claim 37, wherein said battery has a cavity and wherein said state of charge indicator plugs into said cavity of said battery.

43. The system according to claim 42, wherein said battery cavity is uniquely shaped and keyed and wherein said state of charge indicator mates with said cavity and is designed for a particular plurality of batteries

44. The system according to claim 42, wherein said battery cavity is uniquely shaped and keyed and wherein said state of charge indicator fits only in a proper orientation for mating with appropriate electrical interconnecting contact for electrically connecting said state of charge indicator to said battery.

45. The system according to claim 42, wherein said state of charge indicator is secured in said cavity by using an interlocking device.